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[Search Classification Data](#) | [Class Numbers & Titles](#) | [Class Numbers](#) | [USPC Index](#) | [International](#) | [HELP](#) | [Employee by Name](#) | [Employees by Org](#)

[<-Previous Page](#)

## **Class 700 DATA PROCESSING: GENERIC CONTROL SYSTEMS OR SPECIFIC APPLICATIONS**

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- 1      **GENERIC CONTROL SYSTEM, APPARATUS OR PROCESS****
- 2      . Plural processors
- 3      .. Master-slave
- 4      .. Parallel
- 5      ... Shared memory
- 6      .. Hybrid types (analog, digital)
- 7      .. Including sequence or logic processor
- 8      . Cascade control
- 9      . Supervisory control
- 10     .. Of analog controllers
- 11     . Sequential or selective
- 12     .. State of condition or parameter (e.g., on/off)
- 13     ... Position responsive
- 14     ... Time responsive (duration)
- 15     .... Having display
- 16     .... Clock-calendar (e.g., time of day)
- 17     .. Operator interface (e.g., display with control)
- 18     ... Specific programming (e.g., relay or ladder logic)
- 19     .. Plural controlled systems, mechanisms, or elements
- 20     .. Plural controllers
- 21     .. Failure protection or reliability
- 22     .. Electrical power distribution
- 23     .. Sequence program response
- 24     ... Addressing
- 25     ... I/O table
- 26     ... Diagnostics or debugging
- 27     ... Having status indication
- 28     . Optimization or adaptive control
- 29     .. Having model
- 30     ... Comparison with model (e.g., model reference)
- 31     ... Having adjustment of model (e.g., update)
- 32     .. Specific criteria of system performance
- 33     ... Constraint or limit (e.g., max/min)
- 34     .... Variable
- 35     .... Bidirectional (e.g., oscillatory)
- 36     .... Economic (e.g., cost)
- 37     ... Gain (e.g., tuning)
- 38     .. Having perturbation
- 39     ... Test signal
- 40     .. Plural modes
- 41     ... Proportional-Integral (P-I)
- 42     .... Proportional-Integral-Derivative (P-I-D)
- 43     ... Proportional-Derivative (P-D)
- 44     .. Feed-forward (e.g., predictive)
- 45     ... Combined with feedback
- 46     .. Rate control

<u>47</u>	.. Trainable system (e.g., self-learning, self-organizing)
<u>48</u>	... Neural network
<u>49</u>	.. Expert system
<u>50</u>	.. Fuzzy logic
<u>51</u>	.. Statistical process control (SPC)
<u>52</u>	.. Parameter estimation or identification
<u>53</u>	.. Multiple input-multiple output (MIMO) system feature (e.g., decoupling)
<u>54</u>	.. Having particular compensation or stabilization feature
<u>55</u>	... Filtering
<u>56</u>	. Digital positioning (other than machine tool)
<u>57</u>	.. Alignment or registration
<u>58</u>	... Having position marking
<u>59</u>	... Having optical sensing (e.g., image projection)
<u>60</u>	.. Support positioning (e.g., table, stage)
<u>61</u>	.. Multiple axis motion or path control
<u>62</u>	... Orientation (e.g., posture, pose)
<u>63</u>	... Including velocity or acceleration control
<u>64</u>	... Position recording
<u>65</u>	.. Operator control of remotely located element
<u>66</u>	.. Having particular position determining apparatus (e.g., portable or handheld)
<u>67</u>	. Plural variables
<u>68</u>	.. Ratio
<u>69</u>	.. Positional (e.g., velocity, acceleration)
<u>70</u>	... Positional with nonpositional
<u>71</u>	. Specific compensation or stabilization feature
<u>72</u>	.. Lag (e.g., deadtime)
<u>73</u>	. Sampled data system
<u>74</u>	.. Variable rate
<u>75</u>	. Multiple modes (e.g., digital/analog)
<u>76</u>	.. Manual/automatic
<u>77</u>	.. Fine/coarse
<u>78</u>	. Having specific error signal generation (e.g., up/down counter)
<u>79</u>	. Having protection or reliability feature
<u>80</u>	.. Warning or alarm
<u>81</u>	.. Self-test
<u>82</u>	.. Backup/standby
<u>83</u>	. Having operator control interface (e.g., control/display console)
<u>84</u>	.. Keyboard
<u>85</u>	.. Positional (e.g., joystick)
<u>86</u>	. Having preparation of program
<u>87</u>	.. Editing/modifying
<u>88</u>	.. Playback
<u>89</u>	. Having specific algorithm
<u>90</u>	<b>SPECIFIC APPLICATION, APPARATUS OR PROCESS</b>
<u>91</u>	. Contest or contestant analysis, management, or monitoring (e.g., statistical analysis, handicapping, scoring)
<u>92</u>	.. Scoring
<u>93</u>	.. Probability determination or handicapping
<u>94</u>	. Digital audio data processing system
<u>95</u>	. Product assembly or manufacturing
<u>96</u>	.. Integrated system (Computer Integrated Manufacturing (CIM))
<u>97</u>	.. Design or planning
<u>98</u>	... 3-D product design (e.g., solid modeling)
<u>99</u>	... Resource allocation
<u>100</u>	.... Job scheduling
<u>101</u>	..... Priority ordering
<u>102</u>	..... Job release determination
<u>103</u>	... Constraints or rules
<u>104</u>	.... Knowledge based (e.g., expert system)

<u>105</u>	... Rework or engineering change
<u>106</u>	... Material requirement
<u>107</u>	.... Bill of material
<u>108</u>	.. Performance monitoring
<u>109</u>	... Quality control
<u>110</u>	.... Defect analysis or recognition
<u>111</u>	... Worker or work station efficiency
<u>112</u>	.. Having particular work transport control between manufacturing stations
<u>113</u>	... Mobile transport
<u>114</u>	.. Work positioning
<u>115</u>	.. Product tracking (e.g., having product or carrier identification)
<u>116</u>	... Having identification controlled manufacturing operation
<u>117</u>	.. Particular manufactured product or operation
<u>118</u>	... Three-dimensional product forming
<u>119</u>	.... Rapid prototyping (e.g., layer-by-layer, material deposition)
<u>120</u>	..... Stereolithography
<u>121</u>	... Integrated circuit production or semiconductor fabrication
<u>122</u>	... Continuous material having indeterminate length (e.g., web, strand, strip, or sheet)
<u>123</u>	... Material deposition or application (e.g., spraying, coating)
<u>124</u>	.... Registration control
<u>125</u>	..... Having a reference mark or pattern
<u>126</u>	.... Winding
<u>127</u>	.... Sheet making (e.g., paper product)
<u>128</u>	..... Paper machine or subsystem control
<u>129</u>	..... Profile analyzer or controller
<u>130</u>	... Textile
<u>131</u>	.... Pattern design
<u>132</u>	..... For a garment
<u>133</u>	..... Having particular pattern producing operation (e.g., dyeing)
<u>134</u>	.... Pattern cutting
<u>135</u>	.... Pattern matching or positioning
<u>136</u>	.... Sewing
<u>137</u>	..... Having particular input data (e.g., stitch)
<u>138</u>	..... Embroidering
<u>139</u>	.... Spinning or winding (e.g., yarn)
<u>140</u>	.... Loom control
<u>141</u>	.... Knitting
<u>142</u>	.... Fiber preparation
<u>143</u>	.... Having monitoring or inspecting (e.g., abnormality detection)
<u>144</u>	..... Yarn quality
<u>145</u>	... Metal
<u>146</u>	.... Casting or drawing
<u>147</u>	..... Control of metallurgical property
<u>148</u>	.... Rolling
<u>149</u>	..... Having schedule adjustment
<u>150</u>	..... Control or detection of a particular condition
<u>151</u>	..... Speed control
<u>152</u>	..... Tension control (e.g., interstrand)
<u>153</u>	..... Temperature control
<u>154</u>	..... Flatness or crown control
<u>155</u>	..... Thickness control
<u>156</u>	..... Roll eccentricity compensation
<u>157</u>	... Glassware forming
<u>158</u>	... IS (individual section) machine
<u>159</u>	... Machining
<u>160</u>	.... Having particular tool or tool operation
<u>161</u>	..... Tracing or duplicating
<u>162</u>	..... Electrical discharge machining (EDM)
<u>163</u>	..... 3-D sculpturing using nontracing prototype sensor

<u>164</u>	..... Grinding
<u>165</u>	..... Bending (e.g., press brake)
<u>166</u>	..... Laser
<u>167</u>	.... Of elongated material (e.g., timber, veneer, web)
<u>168</u>	.... Portable (e.g., handheld)
<u>169</u>	.... Supervisory control (e.g., plural tools or plural processors)
<u>170</u>	.... Having particular control of a motor parameter
<u>171</u>	.... Material usage optimization
<u>172</u>	.... Multiple mode (e.g., rough-finish, coarse-fine)
<u>173</u>	.... Adaptive (optimizing) system
<u>174</u>	.... Performance monitoring
<u>175</u>	..... Condition of tool or workpiece (e.g., tolerance, tool wear)
<u>176</u>	..... Offsetting
<u>177</u>	..... Protective or diagnostic feature
<u>178</u>	..... Tool/workpiece interference prevention
<u>179</u>	.... Tool selection/change
<u>180</u>	.... Having operator interface feature
<u>181</u>	..... Specific programming format (e.g., macro)
<u>182</u>	..... Including CAD, CAM, or CIM technique
<u>183</u>	..... Preset pattern
<u>184</u>	..... Machining path display
<u>185</u>	..... Prompting technique
<u>186</u>	.... Digital positioning technique
<u>187</u>	..... For curve or contour
<u>188</u>	..... Including velocity or acceleration control
<u>189</u>	..... Interpolation
<u>190</u>	..... Specified tool feed path at entry or withdrawal
<u>191</u>	..... Repeated machining passes
<u>192</u>	..... Alignment of tool or workpiece (e.g., origin or path return)
<u>193</u>	..... Positional compensation or modification compensation or mod
<u>194</u>	.... Coordinate transformation technique
<u>195</u>	.... Having particular measuring device (e.g., probe)
<u>196</u>	... Extruding
<u>197</u>	... Molding
<u>198</u>	.... Control of curing
<u>199</u>	..... Vulcanization
<u>200</u>	.... Injection
<u>201</u>	..... Plural molding machines or stations
<u>202</u>	..... Control of temperature
<u>203</u>	..... Control of pressure
<u>204</u>	.... Monitoring, inspection, or control of a particular condition
<u>205</u>	..... Control of temperature
<u>206</u>	... Pressing
<u>207</u>	... Heating
<u>208</u>	.... Drying
<u>209</u>	.... Furnace
<u>210</u>	..... Multizone
<u>211</u>	.... Oven
<u>212</u>	.... Sintering, soldering, or bonding
<u>213</u>	. Article handling
<u>214</u>	.. Article storing, retrieval, or arrangement (e.g., warehousing, automated library)
<u>215</u>	... Having an identification code
<u>216</u>	... Order filling
<u>217</u>	... Article support load management (e.g., palletizing)
<u>218</u>	... Particular charging or discharging apparatus
<u>219</u>	.. Associating or disassociating plural articles
<u>220</u>	... Inserting
<u>221</u>	.... Having an identification code
<u>222</u>	..... Monitoring or inspection (e.g., incomplete assembly)

X 223	... Collating or sorting
X 224	.... Having an identification code
225	.. Having an identification code
X 226	... Identification code determines article destination
227	.... Preparation of an article for an identification code (e.g., printing, encoding)
228	.. Having particular transport between article handling stations
229	... Transport position identification
230	... Having a conveyor
231	.. Dispensing or vending
232	... Operator or payment initiated
233	.... Customized dispensed article (e.g., operator design)
234	.... Demonstration or duplication of article (e.g., software, video)
235	.... Printing on or of dispensed or vended article
236	.... Data collection or reporting (e.g., sales, inventory)
237	.... Authorization (e.g., password, time usage limit, personal identification number (PIN))
238	.... Price adjustment
239	... Blending or mixing
240	... Condition controlled dispensing (e.g., weight or volume)
241	... Central control of plural dispensing units
242	... Particular supply arrangement (e.g., plural sources or compartments)
243	.... Movable (e.g., rotatable)
244	... Monitoring or inspection
245	.. Robot control
246	.. Combined with knowledge processing (e.g., natural language system)
247	.. Plural controlled devices or plural nonvision controlling devices
248	... Plural robots
249	... Plural processors
250	.. Specific enhancing or modifying technique (e.g., adaptive control)
251	... Coordinate transformation
252	... Interpolation
253	... Programmed data (e.g., path) modified by sensed data
254	... Compensation or calibration
255	... Collision prevention
256	... Overload prevention
257	... Based on user input
258	.. Having particular sensor
259	... Vision sensor (e.g., camera, photocell)
260	.. Having control of force
261	... Having control of robot torque
262	.. Using particular manipulator orientation computation (e.g., vector/matrix calculation)
263	... Using Jacobian computation
264	.. Having particular operator interface (e.g., teaching box, digitizer, tablet, pendant, dummy arm)
265	.. Nonreactive mixing process (e.g., mixing cement, preparing solution, diluting chemical)
266	.. Chemical process control or monitoring system
267	.. Titration or pH level
268	.. Synthesis process
269	... Polymerization/trimerization
270	.. Distillation
271	.. Refinement or purification or rejuvenation
272	... Of fuel
273	.. Separation process
274	.. Control of combustion or heating apparatus (e.g., kiln, furnace, autoclave, burner, combustion system)
275	.. Mechanical control system
276	.. HVAC control

<u>277</u>	... Multiple zones
<u>278</u>	... Specific thermally responsive controller
<u>279</u>	.. Balancing or alignment
<u>280</u>	.. Vibration or acoustic noise control
<u>281</u>	.. Control of fluid level or volume
<u>282</u>	.. Flow control (e.g., valve or pump control)
<u>283</u>	... Dispensing management (e.g., spraying)
<u>284</u>	.... Irrigation
<u>285</u>	... Fluid mixing
<u>286</u>	. Electrical power generation or distribution system
<u>287</u>	.. Turbine or generator control
<u>288</u>	... Cogenerative system
<u>289</u>	... Adaptive valve control
<u>290</u>	.... For turbine speed control
<u>291</u>	.. Energy consumption or demand prediction or estimation
<u>292</u>	.. System protection (e.g., circuit interrupter, circuit limiter, voltage suppressor)
<u>293</u>	... Abnormal power, current, or impedance condition
<u>294</u>	... Abnormal phase, waveform, or polarity condition
<u>295</u>	.. Power allocation management (e.g., load adding/shedding)
<u>296</u>	... Time based control (e.g., real time or duty cycle)
<u>297</u>	.. Power supply regulation operation
<u>298</u>	... By voltage regulation
<u>299</u>	. Specific application of temperature responsive control system
<u>300</u>	.. For heating or cooling
<u>301</u>	. Specific application of pressure responsive control system
<u>302</u>	. Specific application of positional responsive control system
<u>303</u>	. Specific application of dimensional responsive control system
<u>304</u>	. Specific application of speed responsive control system
<u>305</u>	. Specific application of weight responsive control system
<u>306</u>	. Specific application of control based on elapsed time

## CROSS-REFERENCE ART COLLECTIONS

900      **SPECIAL ROBOT STRUCTURAL ELEMENT**

## FOREIGN ART COLLECTIONS

FOR000      **CLASS-RELATED FOREIGN DOCUMENTS**

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collections listed below. These Collections contain ONLY foreign patents or non-patent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

<u>FOR101</u>	<b>SEQUENTIAL OR SELECTIVE DATA PROCESSING CONROL SYSTEM, METHOD, OR APPARATUS (364/140)</b>
<u>FOR102</u>	<b>OPTIMIZATION OR ADAPTIVE DATA PROCESSING CONTROL SYSTEM, METHOD, OR APPARATUS (364/148)</b>
<u>FOR103</u>	<b>DIGITAL POSITIONING (OTHER THAN MACHINE TOOL) CONTROL SYSTEM, METHOD, OR APPARATUS (364/167.01)</b>
<u>FOR104</u>	<b>GAME OR AMUSEMENT (364/410)</b>
<u>FOR105</u>	. Scoring (364/411)
<u>FOR106</u>	. Wagering (364/412)

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